

In the Claims:

Please amend the claims as follows:

a' 1 1. (Original) A method of characterizing a sample surface having a surface
2 anomaly region, the method comprising:
3 profiling the sample surface to generate surface characteristic data;
4 generating a histogram based on said profiling step; and
5 measuring a surface anomaly in the surface anomaly region based on said
6 generating step.

1 2. (Original) The method of Claim 1, further including the step of selecting a
2 zone of interest from the surface characterization data.

1 3. (Original) The method of Claim 2, wherein the zone of interest includes the
2 surface anomaly region.

1 4. (Original) The method of Claim 3, wherein the surface anomaly region
2 includes one of erosion and dishing. *lacking depth, meaning little from bottom to top (of surface)*

1 5. (Original) The method of Claim 4, wherein the dishing is a single dishing.

1 6. (Original) The method of Claim 1, wherein the histogram includes a first peak
2 corresponding to a generally planar portion of the sample surface, and a second peak
3 corresponding to the surface anomaly.

1 7. (Original) The method of Claim 6, wherein said measuring step includes
2 determining a distance between the first and second peaks.

1 8. (Original) The method of Claim 7, wherein the distance is indicative of the
2 depth of the surface anomaly.

1 9. (Original) The method of Claim 6, wherein the surface anomaly region
2 includes a plurality of surface anomalies, and wherein the histogram includes a third peak
3 corresponding to a different surface anomaly, and wherein said measuring step includes
4 determining a distance between the second and third peaks.

1 10. (Original) The method of Claim 1, further including the step of smoothing
2 the histogram.

1 11. (Original) The method of Claim 10, wherein said smoothing step includes
2 using a Gaussian filter.

1 12. (Original) The method of Claim 1, further comprising the step of leveling the
2 surface characteristic data.

1 13. (Original) The method of Claim 1, wherein the histogram includes a first
2 peak corresponding to a first depth associated with the surface characterization data, and
3 a second peak corresponding to a second depth associated with the surface characteristic
4 data.

1 14. (Original) The method of Claim 13, wherein the first depth corresponds to a
2 generally planar portion of the sample surface, and the second depth corresponds to the
3 surface anomaly.

1 15. (Original) The method of Claim 14, wherein the sample includes a metal-
2 filled trench and the surface anomaly is associated with the trench.

3 16. (Currently Amended) The method of Claim 15, wherein the surface anomaly
4 is negatively eroded metal in the trench.[[.]]

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1 17. (Currently Amended) A method that measures dishing values and erosion
2 values associated with topography data generated by scanning a semiconductor surface to
3 obtain surface profile data comprises the steps of:

4 (A) generating a histogram of a portion of the surface profile data
5 corresponding to a first zone of interest, wherein the surface profile data includes data
6 indicative of a depth of the surface; and

7 (B) smoothing the histogram of said generating step to produce a
8 smoothed curve having a peak corresponding to one of a dishing value and an erosion
9 value.

1 18. (Original) The method of Claim 17, further including the step of repeating
2 steps (A) and (B) relative to a plurality of additional zones of interest so as to produce
3 smoothed curves including data relating to a corresponding dishing value or erosion value
4 or both for each of the plurality of additional zones of interest.

1 19. (Original) The method of Claim 17, further including the step of leveling the
2 surface profile data prior to step (A).

1 20. (Original) The method of Claim 17, further including the step of filtering the
2 histogram after step (A) and prior to step (B).

1 21. (Original) The method of Claim 17, wherein the first zone of interest
2 includes dishing and erosion data, and wherein the smoothed histogram includes first,
3 second and third peaks corresponding to a reference surface, an erosion value and a
4 dishing value, respectively.

1 22. (Original) The method of Claim 21, wherein a corresponding distance
2 between select pairs of said first, second and third peaks is indicative of a corresponding
3 one of the dishing value and the erosion value.

1 23. (Currently Amended) A method for measuring dishing values and erosion
2 values of a semiconductor surface by scanning the surface to obtain surface profile data
3 that contains either dishing data or erosion data or dishing and erosion data, all referenced
4 to surface data, wherein the improvement comprises the steps of:



5 (A) leveling the surface profile data, wherein the surface profile data is
6 three-dimensional;

7 (B) generating a histogram of a portion of the leveled surface profile data
8 corresponding to a first of a plurality of zones of interest;

9 (C) smoothing the histogram of said generating step to produce a
10 smoothed curve having a maximum value corresponding to an erosion value or a dishing
11 value; and

12 (D) repeating steps (B) and (C) relative to each of the remainder of the
13 plural zones of interest, to produce smoothed curves corresponding to an erosion value or
14 a dishing value or both for each of the remainder of the plural zones of interest.

1 24. (Original) The improved method of Claim 23, wherein the first zone of
2 interest includes dishing and erosion values such that said smoothing step produces a
3 smoothed curve having first and second maximum values corresponding to the dishing
4 and erosion values, respectively.

 Please add the following new claims: 

1 25. (New) A method of characterizing a sample surface having a surface
2 anomaly region, the method comprising:

3 profiling the sample surface to generate surface characteristic data;

4 generating a histogram based on said profiling step;

5 measuring a surface anomaly in the surface anomaly region based on said
6 generating step; and

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(cont)

- 7 wherein the histogram includes a first peak corresponding to a generally
8 planar portion of the sample surface, and a second peak corresponding to the surface
9 anomaly.

(a' (cont'd))
1 26. (New) A method of characterizing a sample surface having a surface
2 anomaly region, the method comprising:
3 profiling the sample surface to generate surface characteristic data;
4 generating a histogram based on said profiling step;
5 measuring a surface anomaly in the surface anomaly region based on said
6 generating step; and
7 wherein the histogram includes a first peak corresponding to a first depth
8 associated with the surface characterization data, and a second peak corresponding to a
9 second depth associated with the surface characteristic data.

1 27. (New) A method that measures dishing values and erosion values associated
2 with topography data generated by scanning a semiconductor surface to obtain surface
3 profile data comprises the steps of:
4 (A) generating a histogram of a portion of the surface profile data
5 corresponding to a first zone of interest, wherein the surface profile data is three-
6 dimensional;
7 (B) smoothing the histogram of said generating step to produce a
8 smoothed curve having a peak corresponding to one of a dishing value and an erosion
9 value; and
10 (C) wherein the first zone of interest includes dishing and erosion data,
11 and wherein the smoothed histogram includes first, second and third peaks corresponding
12 to a reference surface, an erosion value and a dishing value, respectively.

1 28. (New) The method of claim 1, wherein said profiling step is performed using
2 a probe-based instrument.

1 29. (New) The method of claim 28, wherein the probe-based instrument is an
2 atomic force microscope movable in a direction generally perpendicular to the sample
3 surface.
Depend on claim 1

1 30. (New) The method of claim 1, wherein said profiling step is performed using
2 a probe-based instrument, and the surface characteristic data is used to produce indicative
3 of a three-dimensional image.

1 31. (New) The method of claim 30, wherein the probe-based instrument is an
2 atomic force microscope.

1 32. (New) The method of claim 17, wherein the surface characteristic data is
2 generated using a probe-based instrument.

1 33. (New) The method of claim 23, wherein the surface characteristic data is
2 generated using a probe-based instrument.